

## REMARKS

Claims 1-17 were presented in the application as filed. Claims 9-11 and 13-17 were amended in a Preliminary Amendment concurrently filed with the application. Claim 3 was cancelled, and claims 1, 2, 7, 12, and 13-17 were amended in a Response filed July 23, 2007. Claim 4 is cancelled and claims 5-6 are amended. Claims 1, 2, and 5-17 are pending. Entry of these amendments, reconsideration of the application, and allowance of all claims pending herein are respectfully requested in view of the remarks below.

Claims 5 and 6 have been amended to be dependent on claim 1.

No new matter has been added.

## CLAIM OBJECTIONS

The Office Action states that claims 4-6 are objected to as being in improper form because they are dependent on a cancelled claim. Claim 4 has been cancelled. Claims 5 and 6 have been amended to be dependent on claim 1. Reconsideration of claims 5 and 6 under 37 C.F.R. § 175(c) is respectfully requested.

## CLAIM REJECTIONS UNDER 35 U.S.C. § 103

The Office Action states that claims 1-2, 4-8, and 12-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DelaRosa *et al.* (US 6,527,855) in view of Lopatin *et al.* (US 6,482,656). Claims 1, 7, and 12 are independent.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a

reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations [*see*, MPEP 2143].

As to claims 1, 7, and 12, DelaRosa *et al.* is alleged to disclose all the elements of the foregoing claims except for the use of glyoxylic acid and/or imidazole, where appropriate. The Examiner acknowledges that DelaRosa *et al.* fails to teach a reducing gas selected from glyoxylic acid and imidazole. Lopatin *et al.* is alleged to teach a process using a reducing agent selected from glyoxylic acid and/or imidazole. Therefore, it would have been allegedly obvious to one of ordinary skill in the art to modify the invention of Dela Rosa *et al.* by providing a reducing agent taught by Lopatin *et al.* to arrive at the inventions of Applicants' claims 1, 7, and 12.

Applicants respectfully assert that there is no requisite motivation supporting the modification proposed by the Examiner as neither DelaRosa *et al.* nor Lopatin *et al.* provide a basis for the modification. DelaRosa *et al.* discloses cobalt thin films prepared by atomic layer deposition (ALD) and the use of a reducing agent gas, such as an agent possessing a hydride, in the ALD processes disclosed therein and specifically teach only the use of silane and hydrogen as a reducing gas. DelaRosa *et al.* does not disclose the use of a reducing agent selected from glyoxylic acid and/or imidazole as acknowledged by the Examiner. Thus, DelaRosa *et al.* does not provide a basis to modify the process steps disclosed therein to include the step of preparing a barrier layer comprising Ta, TaN, TaSiN, TiW, or Wn, and alloys such as NiW, NiTa, NiMo, CoW, CoTa, CoMo, PdW, PdTa, PdMo, CuBa, and CuBaO, and then exposing the foregoing to a non-gaseous reducing agent selected from glyoxylic acid and/or imidazole as disclosed in Lopatin *et al.*

Lopatin *et al.* discloses a method of forming a superconducting damascene interconnect structure comprising among other steps, the formation of a barrier layer. The barrier layer comprises Ta, TaN, TaSiN, TiW, or WN, and alloys such as NiW, NiTa, NiMo, CoW, CoTa, CoMo, PdW, PdTa, PdMo, CuBa, and CuBaO. The barrier layer is then exposed to a reducing agent. The passage the Examiner refers to, column 12, lines 20-25, specifically teaches the deposition of a CuCaO film by an electroless plating

method. The electroless plating is applied from a solution comprising among other elements: copper salt ( $\text{CuSO}_4$ ), calcium salt ( $\text{CaCO}_3$ ), a complexing agent (EDTA and tartaric acid), and a reducing agent (glyoxylic acid or alternatively, imidazole), which is not a gas. Nowhere in Lopatin *et al.* is the use of a reducing gas taught or suggested. Lopatin *et al.* does not provide a basis for modifying DelaRosa *et al.* to include pulsing in a reducing gas selected from glyoxylic acid and/or imidazole so as to from a layer comprising a metal selected from Pd, Rh, Ru, Pt, and Ir as neither of the foregoing are taught or suggested in Lopatin *et al.*

Applicants also respectfully assert that there is no requisite motivation supporting the modification of DelaRosa *et al.* with Lopatin *et al.* as the Examiner is drawing a conclusion of obviousness from the Applicants' specification. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against the teacher." *In re Lee*, 277 F.3d at 1343, citing *W.L. Gore & Assocs. V. Garlock, Inc.*, 721 F.2d 1 540, 1553 (Fed. Cir. 1983). *See In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988) ("[t]here must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure"); *Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc.*, 381 F.3d 1371 (Fed. Cir. 2004)) ("the suggestion to combine references must not be derived by hindsight from knowledge of the invention itself."). Using an applicant's disclosure as a blueprint to reconstruct the claimed invention from isolated pieces of the prior art contravenes the statutory mandate of § 103, which requires judging obviousness at the point in time when the invention was made. *See Grain Processing Corp. v. American Maize-Prods. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988).

As presented above, nowhere in Lopatin *et al.* is taught or suggested the step of pulsing in a reducing gas selected from glyoxylic acid and/or imidazole as recited in claims 1, 7, and 12. DelaRosa *et al.* also does not teach the foregoing as acknowledged by the Examiner. The foregoing is only taught in Applicants' disclosure and would only be attempted with the guidance of Applicants' disclosure. Thus, Applicants respectfully assert that the Examiner is using Applicants' disclosure as a blue print and using hindsight to reconstruct the claimed invention as recited in claims 1, 7, and 12, and

therefore the combination of DelaRosa *et al.* and Lopatin *et al.* do not render claims 1, 7, and 12 obvious.

In light of the above, Applicants respectfully assert that a *prima facie* case of obviousness has not been established as DelaRosa *et al.* and Lopatin *et al.*, independently or in combination, do not disclose or suggest each and every element as set forth in Applicants' claims 1, 7, and 12, *i.e.*, a reducing gas selected from glyoxylic acid and imidazole, or provide suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Therefore, DelaRosa *et al.* and Lopatin *et al.*, do not render Applicants' claim 1, 7, and 12 obvious. Reconsideration of claims 1, 7, and 12 under 35 U.S.C. § 103(a) is respectfully requested. Claims 2, 5, and 6, which depend from claim 1; claims 8-11, which depend from claim 7; claims 13-17, which depend from claim 12, and add further limitations to allowable claims, are believed allowable for the same reasons.

The Office Action states that claims 9 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DelaRosa *et al.* in view of Lopatin *et al.* as applied to claims 1-8 and 12-17 above, and further in view of Pan *et al.* Claims 9 and 11 are dependent on claim 7.

Applicants' respectfully reassert that claim 7 is not rendered obvious by DelaRosa *et al.* and Lopatin *et al.* for the reasons stated above. Applicants' respectfully assert that the combination of Pan *et al.* with DelaRosa *et al.* and Lopatin *et al.* does not remedy the deficiency present in of the combination of DelaRosa *et al.* and Lopatin *et al.*, *i.e.*, DelaRosa *et al.* and Lopatin *et al.*, independently or in combination, do not disclose or suggest each and every element as set forth in Applicants' claims 7, specifically, a reducing gas selected from glyoxylic acid and imidazole, or provide suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Pan *et al.* does not disclose the use of a reducing gas selected from glyoxylic acid and imidazole, or provide motivation to make such a modification to either of DelaRosa *et al.* or Lopatin *et al.*

In light of the above, Applicants respectfully assert that a *prima facie* case of obviousness has not been established as DelaRosa *et al.*, Lopatin *et al.*, and Pan *et al.*, independently or in combination, do not disclose or suggest each and every element as set forth in Applicants' claim 7, *i.e.*, a reducing gas selected from glyoxylic acid and imidazole, or provide suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Therefore, DelaRosa *et al.*, Lopatin *et al.*, and Pan *et al.*, do not render Applicants' claims 9 and 11 obvious as they depend from claim 7, and add further limitations to an allowable claim, are believed allowable for the same reasons. Reconsideration of claims 9 and 11 under 35 U.S.C. § 103(a) is respectfully requested.

The Office Action states that claims 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over DelaRosa *et al.* in view of Lopatin *et al.* as applied to claims 1-8 and 12-17 above, and further in view of Senkevich *et al.* Claims 9 and 10 are dependent on claim 7.

Applicants' respectfully reassert that claim 7 is not rendered obvious by DelaRosa *et al.* and Lopatin *et al.* for the reasons stated above. Applicants' respectfully assert that the combination of Senkevich *et al.* with DelaRosa *et al.* and Lopatin *et al.* does not remedy the deficiency present in of the combination of DelaRosa *et al.* and Lopatin *et al.*, *i.e.*, DelaRosa *et al.* and Lopatin *et al.*, independently or in combination, do not disclose or suggest each and every element as set forth in Applicants' claim 7, specifically, a reducing gas selected from glyoxylic acid and imidazole, or provide suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Senkevich *et al.* does not disclose the use of a reducing gas selected from glyoxylic acid and imidazole, or provide motivation to make such a modification to either of DelaRosa *et al.* or Lopatin *et al.*

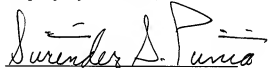
In light of the above, Applicants respectfully assert that a *prima facie* case of obviousness has not been established as DelaRosa *et al.*, Lopatin *et al.*, and Senkevich *et al.*, independently or in combination, do not disclose or suggest each and every element

as set forth in Applicants' claim 7, *i.e.*, a reducing gas selected from glyoxylic acid and imidazole, or provide suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Therefore, DelaRosa *et al.*, Lopatin *et al.*, and Senkevich *et al.*, do not render Applicants' claims 9 and 10 obvious as they depend from claim 7, and add further limitations to an allowable claim, are believed allowable for the same reasons. Reconsideration of claims 9 and 10 under 35 U.S.C. § 103(a) is respectfully requested.

There being no other outstanding issues, it is believed that the application is in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing the prosecution of the subject application, Applicants' undersigned agent invites the Examiner to telephone him at the number provided.

*Respectfully submitted,*

A handwritten signature in black ink, appearing to read 'Surinder S. Punia', written over a horizontal line.

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